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United States Department of Agriculture | Forest Service | Stanislaus National Forest
19777 Greenley Road
Sonora, CA 95370-5909

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Subject: Pest Conditions At Last Chance Project Area (Report No. C95-2)

To: Tom Henry, Hot Springs RD, Sequoia NF

The Last Chance project area was visited by Forest Pest Management (FPM) and Sequoia National Forest personnel on August 16, 1994. Those present included Don Fullmer, SO; Judy Schutza, Tom Henry and George Powell, Hot Springs District; and John Pronos, FPM Service Area Pathologist. Objectives of the visit were to look at stand conditions and recent mortality to determine whether the area was suitable for an FPM prevention/suppression project.

Pest Management prevention projects in Region 5 generally target overstocked stands that have a high probability of being sucessfully attacked by bark beetles. Treatment of such stands involves thinning to reduce stocking and increase the health of residual trees. Thinning trials designed to evaluate the effect of several stocking levels on subsequent pest related mortality found that stocking at 40, 55, and 70 percent of normal all reduced mortality compared to 100 percent of normal. Stands thinned to 40% of normal experienced the least post-treatment mortality. These trials were done in eastside pine stands of low to medium site quality that included some white fir and incense-cedar. Mortality has been followed for 14 years in the study.

The Last Chance area is mixed conifer type with a R5 Site Class of 2. There is good representation of tree species including ponderosa pine, incense-cedar, sugar pine, California black oak, white fir, and Jeffrey pine, listed in order of decreasing basal area. Trees are mostly 60-65 years old with an average basal area of 165 sq. ft./acre, while some aggregations reach 240 sq. ft. There is considerable standing mortality which began approximately 5 years ago. We examined two groups of ponderosa pine that were killed in the last year. There were more than 20 trees in each group, and dead pines were between 8 and 18 inches DBH. The pattern of mortality and pitch tubes present were typical of the western pine beetle (Dendroctonus brevicomis). Biologies of the pests mentioned are included at the end of this report. Smaller mortality groups and scattered indivdual dead white firs were also present. In the Sierra Nevada, the fir engraver beetle (Scolytus ventralis) is associated with most true fir mortality, especially in densely stocked situations or where moisture stress is high.

We concluded from both stand inventory data and general observation that most of the area is overstocked. This overstocking and any past moisture stress due to below normal precipitation would explain the existing mortality. Mortality should be expected to continue unless stocking is reduced in the remaining green trees. Tree removal guidelines should be based on silvicultural

considerations that are expected to produce the greatest tree and stand health. The use of FPM prevention/suppression funds would be appropriate at Last Chance. If the District decides to pursue funding, however, we suggest that our Service Area entomologist (John Wenz) first visit the site to discuss treatment options in more detail.

Please contact the FPM Shared Service Office in Sonora (209) 532-3671 for any additional assistance.

JOHN PRONOS
Plant Pathologist

PEST BIOLOGIES

Western Pine Beetle

The western pine beetle, Dendroctonus brevicomis, breeds in the main bole of living ponderosa and Coulter pine larger than about 4 inches dbh. Normally it breeds in trees weakened by drought, overstocking, root disease, dwarf mistletoe or fire.

Adult beetles emerge and attack trees continuously from spring through fall. Depending on the latitude and elevation, there can be from one to four generations per year. The generations are difficult to distinguish because the prolonged period of initial attack and re-emergence of parent females to establish additional broods causes considerable overlapping of the generations.

Initial attacks are made about mid-bole and subsequent attacks fill in above and below. Pheromones released during a successful attack attract other western pine beetles. Attacking beetles may spill over onto nearby apparently healthy trees and overwhelm them by sheer numbers. Pitch tubes and red boring dust are indications of successful attacks.

Adults bore a sinuous gallery pattern in the cambium and the female lays eggs in niches along the sides. The larvae feed in the inner bark for a short distance and then turn into the outer bark to complete development.

Bluestain fungi introduced during successful attacks probably contribute to the rapid mortality associated with bark beetle attacks.

Woodpeckers, predaceous beetles and low winter temperatures cause natural control. Silvicultural activities that result in rapid, vigorous tree growth increases tree resistance and prevents mortality. Individual high value trees undergoing a temporary reversible stress, such as drought, can be protected for up to a year by applying insecticides to the bole.

Fir Engraver

The fir engraver (Scolytus ventralis) attacks both white and red fir in California. Trees ranging in size from large saplings to overmature sawtimber are susceptible. Attacks can cause patch-killing of cambium along the bole, top-kill, or tree death. Top-kill or death occur most often in firs that have been weakened by root disease, dwarf mistletoe, overstocking, soil compaction, sunscald, logging injury, or drought. The fir engraver also breeds in slash and windthrown trees.

The fir engraver usually completes its life cycle in one year, sometimes two. Adults fly and bore into trees or green fir slash from June to September; larvae, pupae, and adults over-winter under the bark. Pitch tubes are not formed as they are with pine bark beetles; the usual evidence of attack is boring dust in bark crevices along the trunk and pitch streamers on the mid and upper bole. Trees colonized early in the

summer may begin to fade by early fall, but those colonized later in the year usually do not fade until the following spring or summer, often after the beetles have emerged.

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